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A new species of *Hemichela* Stock, 1954 from the South China Sea (Arthropoda, Pycnogonida, Ammotheidae)

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Abstract

A new species of pycnogonid collected by the Chinese research vessel, R/V HY IV, during deep sea cruises to the South China Sea in 2013, is described. The new species, *Hemichela nanhaiensis*, obtained from more than 1300 m depth, is distinguished from the other two species in the genus by the characters of the chela dactylus with 12 denticulations on the inner margin and by the presence of taller tubercles on the lateral processes.

Keywords

Deep sea, South China Sea, Pycnogonida, *Hemichela*

Introduction

Stock (1954) established the new genus *Hemichela* based on the presence of a single dactylus on the chela, segregating it from the closely-related genus *Paranymphon* and he then described *Hemichela micrasterias* the type species of the new genus. According to Bamber et al. (2015) the genus includes two named species to date, *H. micrasterias* Stock, 1954 and *Hemichela longiunguis* Staples, 1982, both from western Pacific localities only. *Hemichela micrasterias* has been found in Indonesia (Stock 1954; Nakamura

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and Child 1990), Philippines (Child 1988b) and Japan (Nakamura and Child 1991) at a depth range of 20–657 meters. *Hemichela longiunguis* is only known from Queensland, Australia, at depths shallower than 5.8 m (Staples 1982).

A re-examination of the types of both of these species by Stock (1985) corrected certain characteristics inadvertently overlooked in his initial description (Stock 1954). Nakamura and Child (1990) demonstrated differences between *H. micrasterias* from the Flores Sea and the holotype, and described the sub-adult and juvenile stages of this species. Bamber (1992) summarized the localities where these species have been found, and discovered evidence for Child's (1983, 1988a) zoogeographic 'corridor' from the Antipodes to Japan.

The Pycnogonida from the islands off the western Pacific coast of China have been summarized by Bamber (1992). Japanese collections were covered by Nakamura and Child (1988a, b, 1990), and Child produced a notable series on the pycnogonids from the western Pacific Islands (1982, 1983, 1988b, 1989, 1990, 1991, 1995, 1996a, b, 1998, 1999). However, despite the long coastlines and numerous islands, pycnogonids from China have been generally poorly studied. Lou (1936a, b) described the sea spiders taken from Yantai and Jiaozhou bays. Bamber (1992, 2004, 2008) and Bamber and Morton (1997) published on the pycnogonids of the South China Sea, Taiwan, and Hong Kong. Huang and Lin (2012) illustrated 13 species recorded in the seas adjacent to China. Compared with the work completed in neighboring seas as have, for example, Nakamura and Child (1991) in Japan, Hong and Kim (1987) in Korea, and Stock (1991) in the Philippines, research on the pycnogonids of China seas are still insufficient.

During 2013, research, including benthic surveying, water sampling, and grabbing for biological and geological specimens, was carried out by the Chinese research vessel R/V HY IV in a cruise to the South China Sea. At station DS06-13, one specimen of Pycnogonida was found representing a new species of *Hemichela* together with other benthic invertebrates such as *Chaetozone setosa* Malmgren, 1867 (Annelida: Polychaeta: Cirratulidae), *Pseudosphyrapus anomalus* (Sars, 1869) (Arthropoda: Malacostraca: Sphyrapodidae), *Asellus* sp. (Arthropoda: Malacostraca: Asellidae), *Eriopisella sechellensis* (Chevreux, 1901) (Arthropoda: Malacostraca: Eriopisidae) and *Grandidierella* sp. (Arthropoda: Malacostraca: Aoridae).

Material and methods

The specimen was collected by a box-core and sorted from the other benthic fauna and sediments from Station DS06-13 and it is conserved as the holotype at the Third Institute of Oceanography, State Oceanic Administration, China (No. DS06-13-01). The specimen was drawn using a *camera lucida* and photographs were made with an Automontage system on a Leica M205 FA stereomicroscope. Measurements were made axially, dorsally for the trunk, laterally for the palp, proboscis and leg, and are given in millimeters.

Systematics

Class Pycnogonida Latreille, 1810
Order Pantopoda Gerstäcker, 1863
Suborder Eupantopodida Fry, 1978
Superfamily Ascorhynchoidea Pocock, 1904
Family Ammotheidae Dohrn, 1881
Genus *Hemichela* Stock, 1954

***Hemichela nanhaiensis* sp. n.**
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Fig. 1

Material examined. One male, holotype (DS06-13-01), Station DS06-13, South China Sea, 21.95°N 118.81 °E, 1317.5 m depth, BC, 5 May 2013.

Diagnosis. Trunk slender, lateral processes with a single distal dorsal tubercle and armed with pedunculate asterisk-shaped setae. Ocular tubercle long with bifurcate tip (Fig. 1A, B). Chela dactylus bearing 12 denticulations on the inner margin (Fig. 1C). Palps seven-articled, second article with a conical outgrowth (Fig. 1A, G). Ovigers ten-articled, fifth article with a reversed spine located on the ventral surface near the proximal end (Fig. 1E arrow b), seventh to tenth articles with compound spines in formula 3: 2: 1: 1 (Fig. 1F). Legs slender, major articles with short lateral spines, main claw approximately 3/5 length of propodus, auxiliary claws absent (Fig. 1D).

Description of the holotype (male). Size large for genus. Trunk slender, intersegmental lines absent, with many tiny papillae (Fig. 1A, B). Lateral processes very long, widely separated, slightly dilated distally, armed with asterisk-shaped setae on tip of tiny outgrowth. A distal dorsal tubercle is present on each lateral processe. Each tubercle long and slender, length is nearly twice diameter of lateral processes, with several minute setae. Ocular tubercle long, erected obliquely, armed with many tiny papillae, tip bifurcate with two lateral tubercles, without obvious eyes (Fig. 1A, B). Proboscis short, like a circular cone with flat tip. Abdomen very tall, directed upwards (Fig. 1A, B).

Chelifore scape one-segmented, armed distally with long setae. Palm short, with several long setae. Chela with one dactylus only, curved and bearing 12 denticulations on inner margin (Fig. 1C).

Palps seven-articled (Fig. 1G, H). First article short, without spines or setae. Second and third articles with few distal long setae. Second article longest, with a conical outgrowth on the outer surface, located in the first third of the article. Fourth to seventh articles armed with fields of ventral and distal setae mostly little longer than their article diameter (Fig. 1H).

Ovigers ten-articled (Fig. 1E, F). First and second articles stout, without setae and spines. Fourth and fifth articles longest, bearing few short setae and spines. Fifth article with a reversed spine basally. Sixth article with two distal spines and few ventral setae.

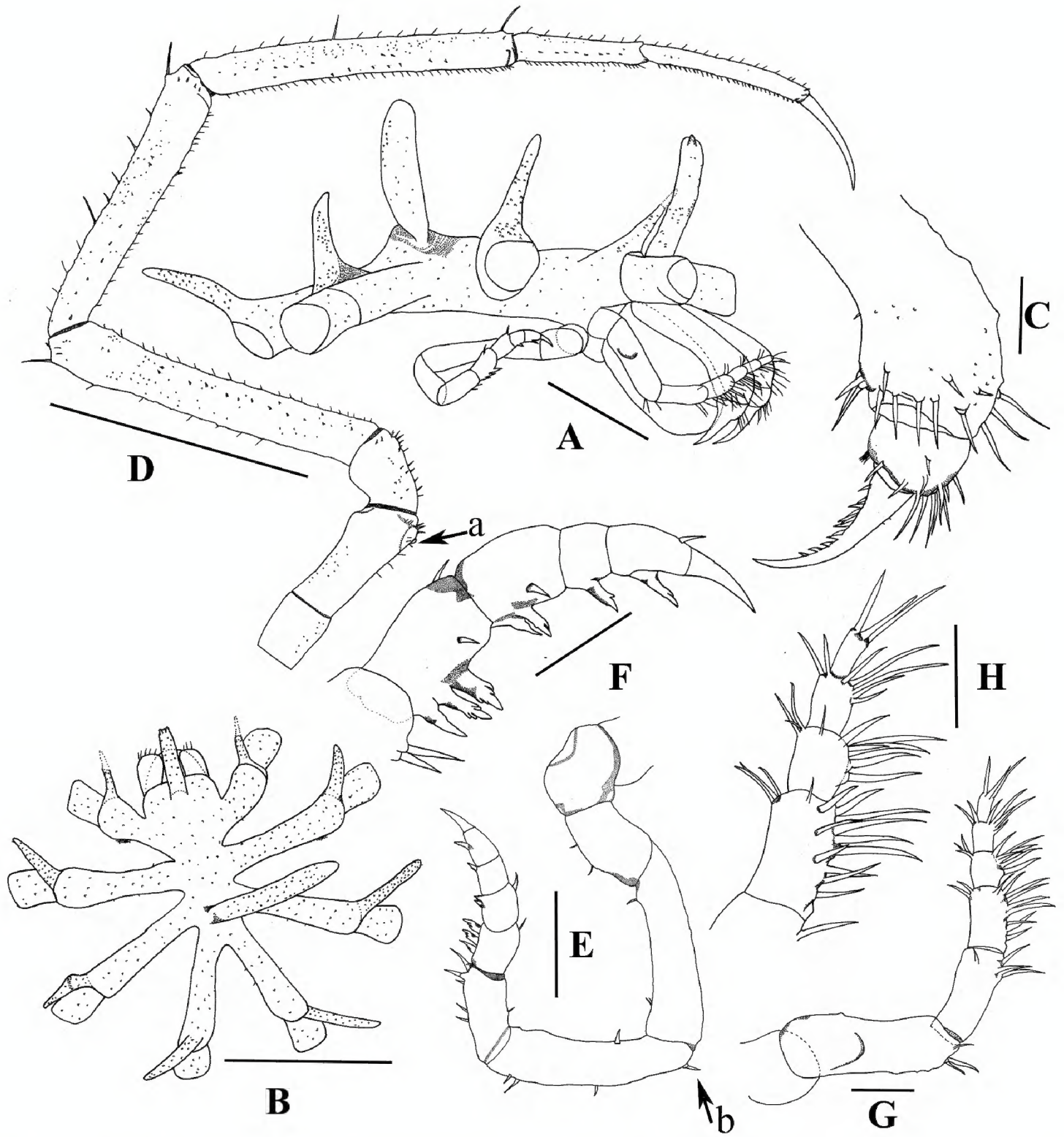

Figure 1. *Hemichela nanhaiensis* sp. n., DS06-13-01, male holotype: **A** trunk, lateral view **B** trunk, dorsal view **C** chela, enlarged **D** leg 3 **E** oviger **F** terminal articles of oviger, enlarged **G** palp **H** terminal articles of palp, enlarged; arrow a, position of genital pore; arrow b, reversed spine. Scale bars **A, B, D** = 1.0 mm; **C, F, H, G** = 0.1 mm; **E** = 0.2 mm.

Seventh to tenth articles with compound spines in formula 3: 2: 1: 1. Each spine bears one to three lateral denticulations. Terminal claw as long as tenth article (Fig. 1F).

Legs slender (Fig. 1D). Major articles with short lateral spines. First coxa short. Second coxa longest, distally swollen, with short ventral and distal seta. Genital pores present on ventral surface of second coxae of the third and fourth legs, borne on a spherical tubercle (Fig. 1D, arrow a). Third coxa short with short setae. Femur and tibiae with short ventral setae, lateral spines and long dorsal setae. Femur and second

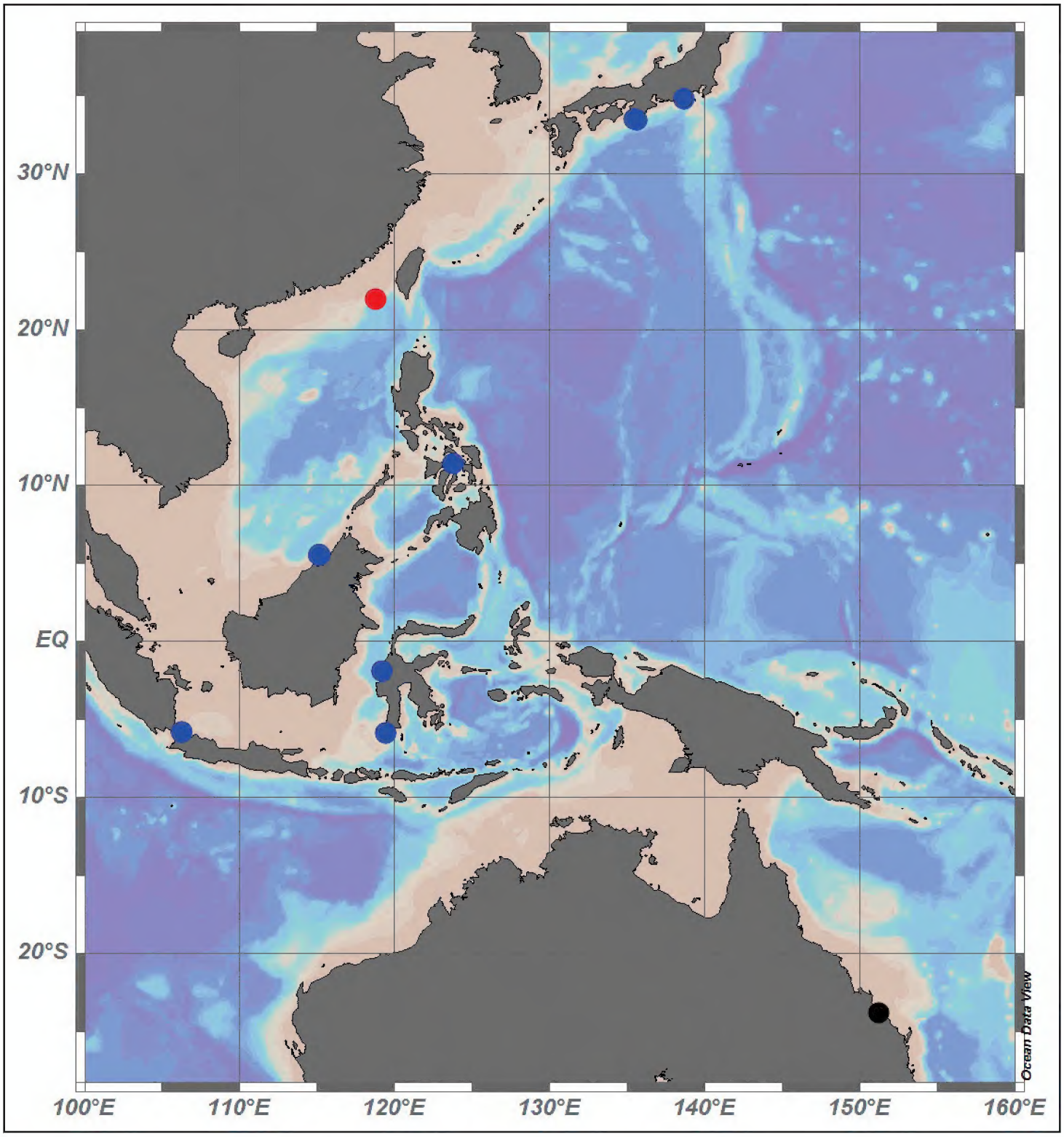

Figure 2. Distribution map of the three species of the genus *Hemichela*: ● *H. micrasterias* ● *H. nanhaiensis* ● *H. longiunguis* (modified from Bamber 1992).

tibia subequal, longer than first tibia. Cement gland not evident. Tarsus long with short setae and spines. Propodus without heel, with single row of sole spines. Main claw strong, approximately 3/5 length of propodus. Auxiliary claws absent.

Female and juvenile are unknown.

Measurements of holotype in mm: Trunk length (from chelifore insertion to tip of fourth lateral processes) 3.46; width across second lateral processes 3.49; proboscis length 0.63.

Lengths of palp articles 1 to 7 respectively: 0.09; 0.25; 0.14; 0.10; 0.06; 0.05; 0.04.

Lengths of oviger articles 1 to 10 respectively: 0.06; 0.13; 0.16; 0.33; 0.33; 0.15; 0.08; 0.08; 0.06; 0.07; 0.07 (claw).

Third leg, coxa 1, 0.24; coxa 2, 0.51; coxa 3, 0.30; femur, 1.24; tibia 1, 1.13; tibia 2, 1.23; tarsus, 0.53; propodus, 0.65; claw, 0.40.

Etymology. The species name, *nanhaiensis*, is derived from the Chinese language, Nanhai meaning South China Sea, referring to the location where the new species was found.

Remarks. The specimen is identified as belonging to the genus *Hemichela* by the absence of a movable chela finger. Compared with *H. longiunguis* and *H. micrasterias*, the body size of *H. nanhaiensis* is distinctly larger, length of lateral process tubercles are nearly twice diameter of lateral processes in *H. nanhaiensis*, and are much taller than those in the other two species, and the *H. nanhaiensis* palps are armed with more setae. The outgrowths with asterisk-shaped setae of *H. micrasterias* are branching and large while the ones of *H. longiunguis* and *H. nanhaiensis* are simple and not distinct. The length ratio of the terminal claw and propodus, 0.62, lies between that of the previous two species (1.06 in *H. longiunguis* and 0.46 in *H. micrasterias*), and the relative length of the oviger terminal claw is evidently shorter than the other species in the genus (the length ratio of terminal claw and tenth article: 1 in *H. nanhaiensis*, 2.33 in *H. longiunguis* and 1.88 in *H. micrasterias*). The chelifores are different from those of the other two species, with 12 denticulations on the inner margin of the dactylus compared to six in *H. micrasterias* and two in *H. longiunguis*; the chelifore scape and palm are armed with more seta than those of the other two species of the genus (Stock 1954, 1985; Staples 1982).

The records of this genus are from Japan to Queensland, Australia (Fig. 2) and the island systems of the western Pacific Ocean, with the deepest record of 657 m in the Flores Sea (Nakamura and Child 1990; Bamber 1992; Müller 1993). The new species was obtained from 1317.5 m, increasing the depth range of this genus. The occurrence of the new species fills a gap in the distribution 'corridor' of this genus, connecting the species in Japan with the Philippines and equatorial and Australian species.

The type habitat was sea floor predominantly composed of soft mud.

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References

Bamber RN (1992) Some Pycnogonids from the South China Sea. Asian Marine Biology 9: 193–203.

Bamber RN (2004) Pycnogonids (Arthropoda: Pycnogonida) from Taiwan, with description of three new species. Zootaxa 458: 1–12.

Bamber RN (2008) A new species of *Pycnogonum* (Arthropoda: Pycnogonida: Pycnogonidae) from Hong Kong. Journal of Natural History 42(9–12): 815–819. doi: 10.1080/00222930701850463

Bamber RN, Morton B (1997) Pycnogonids (Arthropoda: Pycnogonida) from the Cape d'Aguilar Marine Reserve, Hong Kong. Paper presented at: The Marine Flora and Fauna of Hong Kong and Southern China IV: Proceedings of the Eighth International Marine Biological Workshop, the Marine Flora and Fauna of Hong Kong and Southern China, Hong Kong, 2–20 April 1995. Hong Kong University Press, Hong Kong, 192–203.

Bamber RN, El Nagar A, Staples D (Eds) (2015) Pycnobase: World Pycnogonida Database. http://www.marinespecies.org/pycnobase [accessed on 2015–08–14]

Child CA (1982) Pycnogonida from the Western Pacific Islands, I: The Marshall Islands. Proceedings of the Biological Society of Washington 95(2): 270–281.

Child CA (1983) Pycnogonida of the Western Pacific Islands, II: Guam and the Palau Islands. Proceedings of the biological Society of Washington 96(4): 698–714.

Child CA (1988a) Pycnogonida from Aldabra atoll. Bulletin of the Biological Society of Washington, 45–78.

Child CA (1988b) Pycnogonida of the western Pacific islands, III: recent Smithsonian-Philippine expeditions. Smithsonian Institution Press, Washington, 32 pp.

Child CA (1989) Pycnogonida of the western Pacific islands, VI: *Sericosura cochleifovea*, a new hydrothermal vent species from the Marianas back-arc basin. Proceedings of the biological Society of Washington 102(3): 732–737.

Child CA (1990) Pycnogonida of the Western Pacific Islands, VIII: Recent collections from islands of the Great Barrier Reef, Australia. Proceedings of the Biological Society of Washington 103(2): 311–335.

Child CA (1991) Pycnogonida of the western Pacific Islands, IX: A shallow-water Guam survey, 1984. Proceedings of the Biological Society of Washington 104(1): 138–146.

Child CA (1995) Pycnogonida of the western Pacific Islands, XI: Collections from the Aleutians and other Bering Sea islands, Alaska. Smithsonian Institution Press, Washington, 30 pp.

Child CA (1996a) Pycnogonida of the western Pacific islands, XII: A recent diving survey of Okinawa, Ryukyu Islands. Proceedings of the Biological Society of Washington 109(3): 533–539.

Child CA (1996b) Pycnogonida of the western Pacific islands, XIII: Collections from Indonesia, Melanesia, and Micronesia. Proceedings of the biological Society of Washington 109(3): 540–559.

Child CA (1998) Pycnogonida of the Western Pacific Islands, XIV: A Shallow-water Collection from Tonga. Species Diversity 3(2): 289–300.

Child CA (1999) Pycnogonida from the Western Pacific Islands, XV: *Achelia cuneatis* n. sp. and a Known Species from Sakhalin Island, Russian Far East. Species Diversity 4(2): 361–366.

Hong JS, Kim IH (1987) Korean pycnogonids chiefly based on the collections of the Korea Ocean Research and Development Institute. The Korean Journal of Systematic Zoology 3(2): 137–164.

Huang ZG, Lin M (2012) The living species and their illustrations in China's seas (Part II): An illustrated guide to species in China's seas, Vol. 5. China Ocean Press, Beijing, 399 pp. [In Chinese]

Lou TH (1936a) Note sur *Lecythorhynchus hilgendorfi* Bohm (Pycnogonida). Contributions from the Institute of Zoology, National Academy of Peiping 3(5): 133–163.

Lou TH (1936b) Sur deux nouvelles varietes de Pycnogonides recueillies a Tsing-Tao, dans la Baie de Kiao-Chow, Chine. Contributions from the Institute of Zoology, National Academy of Peiping 3(1): 1–34.

Müller HG (1993) World catalogue and bibliography of the recent Pycnogonida. Wissenschaftlicher Verlag, Laboratory for Tropical Ecosystems, Research and Information Service, Wetzlar, 410 pp.

Nakamura K, Child CA (1988a) Pycnogonida of the Western Pacific Islands, IV: On some species from the Ryukyu Islands. Proceedings of the Biological Society of Washington 101(3): 662–670.

Nakamura K, Child CA (1988b) Pycnogonida of the Western Pacific Islands,V: A Collection by the Kakuyo Maru from Samoa. Proceedings of the Biological Society of Washington 101(4): 809–816.

Nakamura K, Child CA (1990) Pycnogonida of the western Pacific Islands, VII: On some rare species from the Flores sea, Indonesia. Proceedings of the Biological Society of Washington 103(2): 304–310.

Nakamura K, Child CA (1991) Pycnogonida from waters adjacent to Japan. Smithsonian Institution Press, Washington, 74 pp.

Staples DA (1982) Pycnogonida of the Calliope River and Auckland Creek, Queensland. Memoirs of the Queensland Museum 20(3): 455–471.

Stock JH (1954) Pycnogonida from Indo-West-Pacific, Australian, and New-Zealand Waters: Papers from Dr Th. Mortensen's Pacific Expedition 1914–1916. Videnskabelige Meddelelser fra Dansk naturhistorisk Foreningen 116: 1–168.

Stock JH (1985) Deux pycnogonides rares, récoltés pendant la campagne CORINDON II dans le détroit de Makassar, Indonésie. Bulletin Zoölogisch Museum, Universiteit van Amsterdam 10(18): 153–158.

Stock JH (1991) Deep-water Pycnogonida from the surroundings of New Caledonia. Résultats des Campagnes MUSORSTOM 8(4): 125–212.